Chapter 2
Site Evaluation Progress

By the end of FY93, nearly 37,500 potential hazardous waste sites had been identified and added to the Superfund inventory. EPA continued its progress in evaluating these sites; by the end of the year, EPA and states had evaluated more than 95 percent of these sites for potential threats posed. To enhance future site evaluation, EPA continued planning the implementation of the streamlined, single-assessment process of the Superfund Accelerated Clean-Up Model (SACM). EPA also proceeded with ongoing efforts to address technical complexities associated with lead and radionuclide contamination, and improved site evaluation guidance.

2.1 Site Evaluation Process

The Superfund site evaluation process begins when EPA is notified of a potentially threatening hazardous waste site or incident. The Agency records basic information about the site in the inventory of potential hazardous waste sites maintained in the CERCLA Information System (CERCLIS), which also tracks subsequent actions and decisions at the site. At sites that pose an immediate threat to human health, welfare, or the environment, EPA conducts a removal action to address the threat. At other sites, a two-stage assessment is conducted, consisting of (1) a preliminary assessment (PA) to determine whether a potential threat exists and (2) a site inspection (SI) to determine the relative threat posed and to evaluate the site for possible listing on the National Priorities List (NPL). The NPL is the list of sites for long-term remedial evaluation and response.

At any point in the evaluation process, EPA may determine that the Superfund evaluation of the site is complete and that no further steps to list the site on the NPL will be taken. EPA places such sites in the "no further remedial action planned" (NFRAP) category. A NFRAP decision does not necessarily mean that there is no hazard associated with the site; it merely means that, based on available information, the site does not meet the criteria for placement on the NPL. As appropriate, a NFRAP site might be addressed under the Resource Conservation and Recovery Act (RCRA), state laws, or other authorities. A Superfund removal action may be taken after a site is placed in the NFRAP category or at any time during the evaluation process if an immediate threat to human health or the environment is identified.

In planning for implementation of SACM, the Agency worked to consolidate the assessment steps of PAs and SIs, as well as other site studies, into a single, integrated site evaluation process. In addition to developing guidance on the new SACM process, EPA conducted pilot projects to explore study consolidation. (See also Chapter 1.)

2.2 Fiscal Year 1993 Progress

During FY93, EPA continued its progress in identifying and assessing potential hazardous waste sites. Exhibit 2.2-1 illustrates the status of sites evaluated through the end of the fiscal year.

Acronyms Referenced in Chapter 2

CDC	Centers for Disease Control
CERCLIS	CERCLA Information System
CLP	Contract Laboratory Program
DOE	Department of Energy
HEAST	Health Effects Assessment Summary Tables
HRS	Hazard Ranking System
IEUBK	Integrated Exposure Uptake Biokinetic
NAREL	National Air and Radiation Environmental Laboratory
NFRAP	No Further Remedial Action Planned
NPL	National Priorities List
NRC	Nuclear Regulatory Commission
OERR	Office of Emergency and Remedial Response
ORD	Office of Research and Development
ORIA	Office of Radiation and Indoor Air
OSWER	Office of Solid Waste and Emergency Response
PA	Preliminary Assessment
RCRA	Resource Conservation and Recovery Act
RPM	Remedial Project Manager
SACM	Superfund Accelerated Clean-Up Model
SI	Site Inspection
SIP	Site Inspection Priorization
TIB	Toxics Integration Branch
TSC	Technical Support Center

2.2.1 CERCLIS Site Additions: Discoveries and Removals

When the Agency is notified of a site that may pose a threat, EPA records basic information about the site in CERCLIS, the national inventory of potential hazardous waste sites. EPA is notified of potential hazardous waste sites in a variety of ways. Information may be provided by states, handlers of hazardous materials, or concerned citizens. Local law enforcement officials may submit a formal report to EPA or facility managers may notify EPA of a release as required by CERCLA Section 103. Section 103 specifies that a person, such as a manager in charge of a vessel or facility, must immediately report to the National Response Center any release of hazardous substance of an amount that is equal to or greater than the reportable quantity for that substance. The National Response Center operates a 24-hour hotline for immediate notification. Penalties are imposed for failure to comply with this reporting requirement.

EPA added approximately 1,100 sites to CERCLIS during FY93, bringing the total number of sites under Superfund to nearly 37,500. With the exception of 400 sites where a removal action was conducted to immediately address threats posed by the sites, PAs have been or will be conducted to assess threats posed by the sites.

2.2.2 Preliminary Assessments Completed

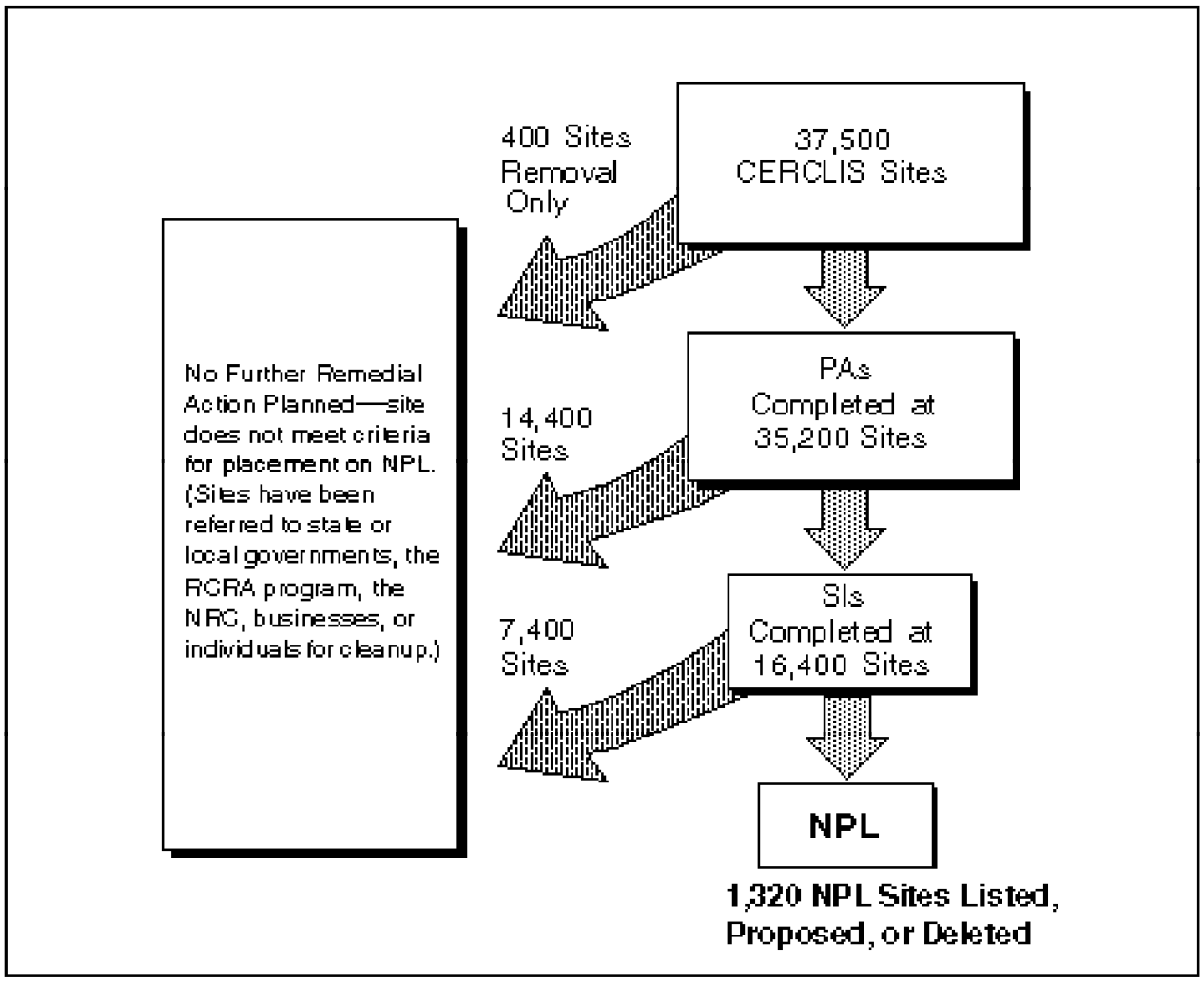
When notified of a potential hazardous waste site, EPA or the state will conduct a PA to assess the threat posed by the site. The PA can include either on-site or off-site reconnaissance activities, such as an on-site visit or survey, an off-site perimeter survey, or collection of data from local authorities. EPA or the state will also review other existing site-specific information for such items as past state permitting activities, local population statistics, and any other information concerning the site's potential effect upon the environment. PA activities enable the Agency or state to determine whether further study of the site or removal assessment/action is necessary, or whether the site should be categorized as NFRAP. If the PA indicates that a potential threat to human health or the environment is posed by the site, EPA will perform an SI to determine whether the site should be proposed for listing on the NPL.

EPA and states conducted more than 1,100 PAs in FY93. Since the inception of Superfund, EPA and states have completed PAs at approximately 35,200 sites, which is more than 95 percent of the sites in CERCLIS where PAs were required; an additional 2,100 sites still require PAs. The Agency has classified approximately 40 percent of sites where a PA has been conducted as NFRAP; the remainder have proceeded to the SI stage for more extensive evaluation.

2.2.3 Site Inspections Completed

The purpose of the SI is to continue the evaluation of a site to determine whether a site is appropriate for listing on the NPL. The SI usually includes collecting

Exhibit 2.2-1
Status of Sites in the Superfund Inventory



Source: CERCLIS.

and analyzing environmental and waste samples to determine

- The hazardous substances present at the site;
- The concentrations of these substances;
- Whether the substances are being released or there is potential for their release; and
- Whether the identified hazardous substances are attributable to the site.

During the SI, data are gathered through increasingly focused collection efforts. At any time during the SI, EPA may make a NFRAP decision based on the data. For sites judged to be prospective candidates for the NPL, the data will be used to calculate a score using the Hazard Ranking System (HRS). The HRS serves as a screening device to evaluate and measure the relative threat a site poses to human health, welfare, or the environment and to determine whether placement on the NPL is warranted. The HRS evaluates four pathways through which contaminants from a site may threaten human health or the environment: ground water, surface water, soil, and air.

The Agency completed more than 700 SIs during FY93 for a total of more than 16,400 SIs conducted

since the inception of the Superfund program. Approximately 45 percent of these SIs have resulted in NFRAP decisions. As of the close of the fiscal year, there were approximately 2,700 sites where, based on data from the PA, SIs were necessary but had not yet been completed.

2.3 National Priorities List

The NPL is the list of sites for long-term remedial evaluation and response. EPA evaluates the potential hazard of sites using the HRS. If a site scores 28.50 or higher, the Agency proposes the site for listing on the NPL, solicits public comments for consideration, and then either announces the final listing of the site on the NPL or removes the site from consideration for listing (classified as NFRAP). A site remains on the NPL until no further CERCLA response action is appropriate. When these conditions are met, EPA deletes the site from the NPL.

2.3.1 National Priorities List Updates

At the end of FY93, there were 1,320 NPL sites proposed to, listed on, or deleted from the NPL: 1,197 currently listed sites, 71 proposed sites, 51 deleted sites where all CERCLA clean-up goals have been achieved, and 1 site that was deferred to another authority for cleanup. Exhibit 2.3-1 illustrates the historical number of final sites on the NPL for each fiscal year since SARA was enacted in 1986.

Of the 1,320 NPL sites at the end of FY93,

- 1,177 were non-federal sites (1,074 currently listed sites, 51 proposed sites, 51 deleted sites, and 1 deferred site); and
- 143 were federal facility sites (123 currently listed sites and 20 proposed sites).

Updates to the NPL during FY93 included current listing of 33 sites (26 non-federal and 7 federal facility sites), proposal of 52 sites (34 non-federal and 18 federal facility sites), deletion of 11 sites (non-federal sites), and deferral of one site (non-federal site). Seven sites were proposed for deletion during the fiscal year, including four of the sites that were deleted and the one site that was deferred. Listings and proposals to the NPL were included in a final rule, published in the *Federal Register* on October 14, 1992, and three proposed rules (NPL Updates 13, 14, and 15), published in the *Federal Register* on October 14, 1992, May 10, 1993, and June 23, 1993.

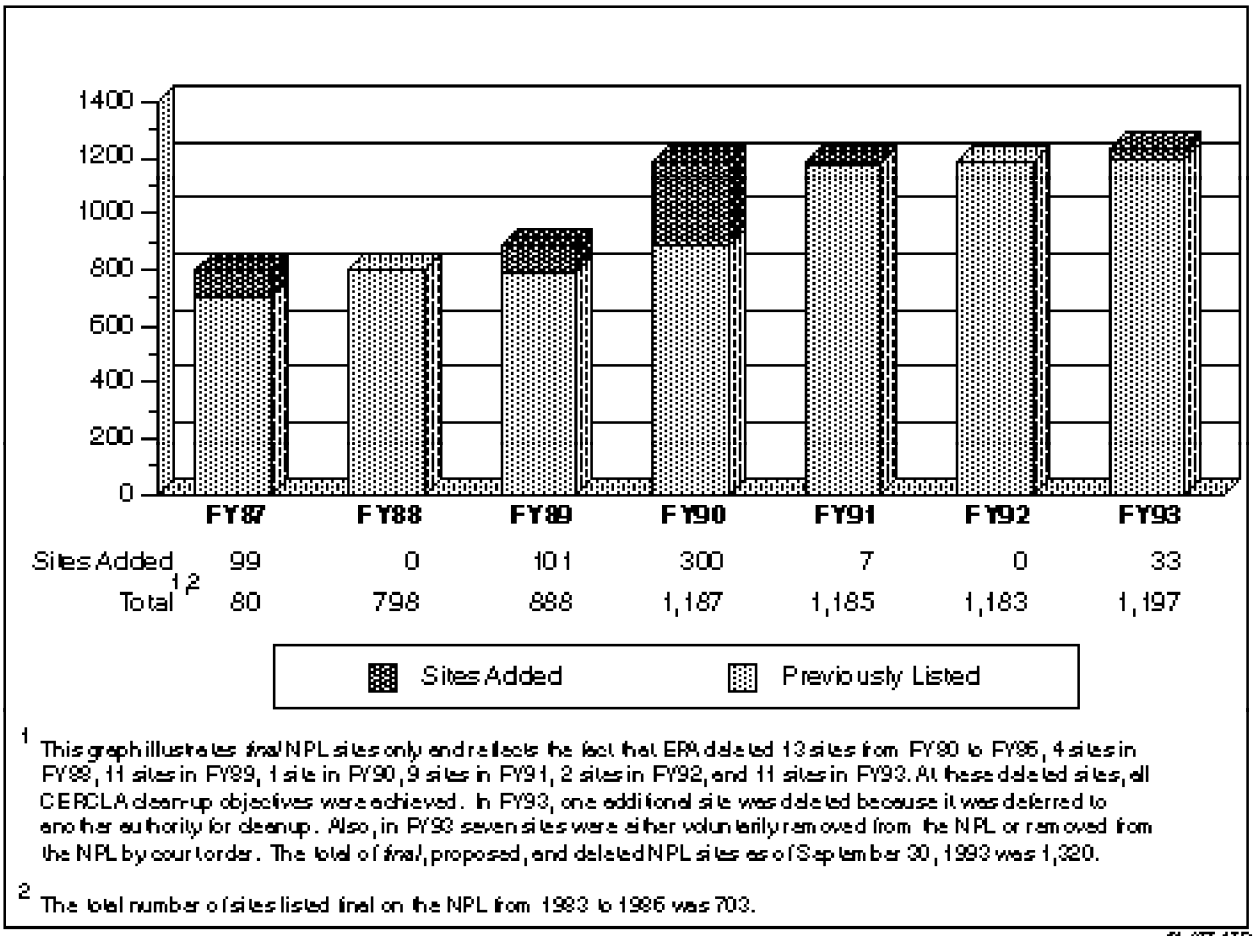
2.3.2 Relationship Between CERCLIS and NPL Data

CERCLIS is used to track the discovery of potential hazardous waste sites, including those that are subsequently listed on the NPL, and to track actions at these sites. Of the nearly 37,500 sites in CERCLIS at the end of FY93, 1,320 were either proposed to, listed on, or deleted from the NPL. Sites deleted from the NPL reflect an activity required to be reported. Although the sites on the NPL are a relatively small subset of the inventory in CERCLIS (approximately 3.5 percent), they generally are the most complex and environmentally significant sites. Under CERCLA, EPA can only use the Trust Fund for long-term remedial actions at NPL sites. Fund money, however, can be used to undertake a removal action at a site, whether or not it is on the NPL. Chapter 4 of this Report highlights progress in remediating NPL sites.

2.4 Site Evaluation Support Activities

EPA manages two support programs dedicated to addressing lead and radionuclide contamination since these contaminants present special hazards and problems. During the fiscal year, EPA continued its progress under these programs. Under the lead program, EPA developed a model and guidance for determining acceptable levels of lead in soil and analyzed results from a three-city study on lead contamination. Under the radiation program, EPA continued to develop guidance addressing radiation issues, examined environmental fate and transport modeling for radionuclides, and assisted the Regions in addressing radioactive sites.

Exhibit 2.3-1
Final NPL Sites for Fiscal Year 1987 Through Fiscal Year 1993



[1] This graph illustrates final NPL sites only and reflects the fact that EPA deleted 13 sites from FY90 to FY95, 4 sites in FY88, 11 sites in FY89, 1 site in FY90, 9 sites in FY91, 2 sites in FY92, and 11 sites in FY93. At these deleted sites, all CERCLA clean-up objectives were achieved. In FY93, one additional site was deleted because it was deferred to another authority for clean-up. Also, in FY93 seven sites were either voluntarily removed from the NPL or removed from the NPL by court order. The total of final, proposed, and deleted NPL sites as of September 30, 1993 was 1,320.

[2] The total number of sites listed final on the NPL from 1983 to 1986 was 703.

Source: *Federal Register* notices through September 30, 1993.

2.4.1 Lead Program Progress

Lead is one of the most frequently found toxic substances at Superfund sites. Lead is also a major contaminant and health threat to children in urban areas that are not associated with Superfund sites. EPA is attempting to better assess the effects of lead contamination in three initiatives: developing the Integrated Exposure Uptake Biokinetic (IEUBK) Model, revising the *Soil Lead Directive*, and conducting the *Three-City Lead Study*.

The Integrated Exposure Uptake Biokinetic Model

To aid Regional risk managers in establishing lead clean-up levels for soil, EPA's Toxics Integration Branch (TIB) is developing risk assessment procedures and tools such as the IEUBK Model. This model estimates blood-lead levels in children who may have been exposed to lead through air, soil, dust, drinking water, and paint, or their diet. The IEUBK Model uses site-specific data or, if no such data are available, default values that are based on national averages. Risk managers can also use the model with reasonable parameter assumptions in order to evaluate response options where significant threats exist.

During FY93, EPA continued to work on an IEUBK manual that will provide guidance to risk assessors and managers for using site-specific data in the IEUBK Model, and for identifying the most appropriate methods for collecting data. Fiscal year activities included validating the IEUBK Model by studying data from Superfund sites contaminated

with lead from mining and smelting activities. Future validation studies will be conducted using urban sites and battery-recycling sites.

Soil Lead Directive

In FY93, TIB began revising the Office of Solid Waste and Emergency Response (OSWER) directive on lead in soil. The revised directive will present a streamlined approach for determining protective levels of lead in soil at Superfund and RCRA corrective action sites. To support the revision, TIB consulted the Office of Prevention, Pesticides, and Toxic Substances for information on its regulatory program for lead in soil, dust, and paint and also with representatives from the Centers for Disease Control (CDC), the Agency for Toxic Substances and Disease Registry, and the Department of Housing and Urban Development. The revised directive will establish lead screening levels, below which no further action would normally be required, and will outline a process, using the IEUBK Model, that can be used in developing site-specific soil clean-up goals. It will also provide guidance for identifying all potential sources of exposure to lead in an effort to keep exposure to the lowest level possible.

Three-City Lead Study

During the fiscal year, EPA analyzed data generated by the *Three-City Lead Study*. The purpose of the study, which is being conducted by EPA with the support of the CDC and the Department of Agriculture, is to determine whether reducing lead in residential soil and dust (interior house dust and exterior soil dust) results in a decrease of blood-lead levels of children exposed to the contaminant. Data were gathered from groups of children in Baltimore, Boston, and Cincinnati living in selected areas within each city. Each area was chosen on the basis of several factors, including the age of the housing, the reported incidence of lead poisoning, the expected turnover rate for residents, and the potential for neighborhood involvement in the project.

EPA's Office of Emergency and Remedial Response (OERR) and the Office of Research and Development (ORD) finalized the reports on the Baltimore and Cincinnati studies and began analyzing combined data sets for all three cities. OERR and ORD prepared a draft report that integrated the results of the *Three-City Lead Study* data set, circulated the draft report for internal review, and provided it for external review. EPA held a workshop to discuss comments received.

2.4.2 Radiation Program Progress

During the fiscal year, EPA made progress in addressing technical complexities associated with site assessments, risk assessments, and clean-up technology evaluations for sites contaminated with radionuclides. Activities included developing Superfund guidance, examining environmental fate and transport modeling, conducting technology demonstrations and evaluations, and providing other technical support to the Regions.

Superfund Program Guidance

During FY93, EPA continued its efforts to address radiation issues through guidance development including the following:

- *Health Effects Assessment Summary Tables (HEAST)*: TIB cooperated with the Office of Radiation and Indoor Air (ORIA) to update toxicity information on radionuclides for the Health Effects Assessment Summary Tables (HEAST).
- *Radiation Exposure and Risk Assessment Manual*: ORIA is developing guidance for environmental pathway modeling and toxicity assessment for radionuclides. As of the end of the fiscal year, the draft manual had undergone peer review.
- *Soil Treatability Guidance*: ORIA began developing guidance for determining the appropriate treatment options for soil contaminated with radionuclides.
- *Development of Clean-Up Levels*: ORIA continued to develop standard clean-up levels for radioactive materials in soil and ground water at radionuclide-contaminated federal facility sites.

Environmental Fate and Transport Modeling

Representatives from OSWER and ORIA continued to work with representatives from the Department of Energy (DOE) and the Nuclear Regulatory Commission (NRC) as part of an interagency working group evaluating environmental fate and transport modeling for radionuclides. The working group completed the following three reports during the year:

- *Computer Models Used to Support Decision Making at Hazardous and Radioactive Waste Sites*: This report describes and classifies the types of computer models that are being used to support decision making at hazardous and radioactive waste sites.
- *Environmental Characteristics of EPA, NRC, and DOE Sites Contaminated with Radioactive Substances*: This report provides an overview of general and unique problems prevalent at radionuclide- contaminated sites. The report also characterizes NPL and Site Decommissioning Management Program sites and lists the types of waste found at the sites.
- *Environmental Pathway Models -- Ground-Water Modeling in Support of Remedial Decision Making at Sites Contaminated with Radioactive Material*: This report addresses the role of and need for modeling to support remedial decision making at sites contaminated with radioactive material.

Regional Assistance

ORIA provided the Regional offices with assistance to address NPL sites contaminated with radioactive materials. In addition, the ORIA National Air and Radiation Environmental Laboratory (NAREL), assisted by the ORIA Las Vegas Facility, continued to serve as an EPA technical support center (TSC). ORIA and its laboratories provided the following site-specific support to Regional programs:

- ORIA assisted Region 2 in resolving a disagreement with DOE concerning appropriate clean-up levels for radium and thorium and in evaluating remedial technologies in Maywood, New Jersey. ORIA also reviewed proposed alternatives for remedial action and assisted in remedial technology evaluation for the W.R. Grace site in Wayne, New Jersey.
- In Region 3, ORIA provided a scanner van to locate radionuclide-contaminated properties in Lansdowne, Pennsylvania.
- ORIA continued to provide assistance to Region 4 for oversight of the DOE remediation efforts in Paducah, Kentucky, and Oak Ridge, Tennessee.
- In Region 5, ORIA supported risk assessment and document review activities, as well as decision making on the cleanup of thorium, at the Kerr-McGee/West Chicago site.
- In Region 7, ORIA assisted in evaluating remedial technologies and determining the clean-up level for thorium at the Weldon Springs site. ORIA also supported OERR and the Region in recommending interim safety measures at the St. Louis Airport site.
- ORIA assisted in evaluating remedial technologies for the Denver Radium site in Region 8. For the Rocky Flats site, ORIA worked with the Remedial Project Manager (RPM) on technical issues associated with the site; NAREL/TSC provided document review support for the site.
- In Region 9, NAREL/TSC evaluated clean-up methods and assisted in the remediation activities at the Hunter's Point Naval Shipyard.
- In Region 10, ORIA supported technology evaluations for the NPL site at DOE's Idaho National Engineering Laboratory. ORIA also assisted the RPM at the Teledyne Wah Chang site in reviewing documents and recommending that the potentially responsible party conduct a more thorough characterization of the radioactivity at the site.

2.5 SITE EVALUATION REGULATIONS AND GUIDANCE

OERR published several site evaluation guidance documents during FY93. These documents address improvements in the site evaluation process, facilitate the generation of useable analytical data to support clean-up decisions, and aim to increase public involvement throughout the site evaluation process.

2.5.1 Evaluating Superfund Sites

To improve the site evaluation process, the Agency published guidance for implementing the streamlined SACM process, prioritizing sites for evaluation, and providing additional information on the health effects of hazardous substances found at Superfund sites. Guidance issued during the year included the following:

- *Health Effects Assessment Summary Tables (HEAST) (EPA 540-R-93-058), March 1993*: This document contains provisional slope factors, reference doses, and reference concentrations for chemicals commonly found at Superfund sites. HEAST is Superfund's secondary source for toxicity information; the primary source is the Integrated Risk Information System.
- *Health Effects Assessment Summary Tables (HEAST), Supplement No. 1 to the March 1993 Annual Update (OERR 9200.6-3-3 [93-1]), July 1993*: This document supplements the annual HEAST by providing toxicity information for additional chemicals and updated information for previously documented chemicals.
- *Additional Guidance on "Worst Sites" and "NPL-Caliber Sites" to Assist SACM Implementation, August 1993*: This document provides criteria to guide EPA Regions in identifying NPL-caliber sites. The document also defines the types of actions needed to support the Agency's implementation of SACM, thereby facilitating data gathering to support NPL listing and remedial investigation/feasibility study decisions.
- *Site Inspection Prioritization Guidance (9345.1-15FS), August 1993*: This fact sheet provides guidance to EPA, state, and contractor staff on prioritizing sites that require SIs. The fact sheet also discusses the SI prioritization (SIP) process, the different levels of activity that a SIP may entail, and steps in reviewing and evaluating existing information.
- *Integrating Removal and Remedial Site Assessment Investigations (EPA 540-F-93-038), September 1993*: This fact sheet provides specific direction for integrating PAs, SIs, and removal assessments for planning SACM integrated assessments.

2.5.2 Improving Data Usability

The Agency developed guidance to ensure the quality of data generated under the Contract Laboratory Program (CLP) and to facilitate the ultimate use of the data in the site evaluation process. Guidance issued during the year included the following:

- *Procedures to Ensure that CLP Laboratories are not Paid for Non-Compliant or Unusable Data (OSWER Directive 9200.9-02), August 1993*: This directive requires the Regions to actively accept CLP data by submitting completed data acceptance/rejected/reduced value forms to Headquarters. Forms must be submitted within the government inspection and acceptance period stated in CLP contracts. The directive also requires each Region to designate a data acceptance official, who is responsible for preparing standard operating procedures for the data review process and for training all CLP users in program procedures.
- *Guidelines for Management of Technical and Evidentiary Audits of CLP Laboratories (Analytical Operations Branch Guidance 001-93), September 1993*: This guidance describes the Technical Project Officer's role in monitoring CLP laboratory performance, including guidance for tracking actions that laboratories have undertaken to correct any deficiencies.

2.5.3 Increasing Community Involvement

EPA published guidance for EPA staff, contractors, and the general public with the intent of increasing public involvement in the site evaluation process. The documents assist EPA in addressing citizens' concerns, answering their questions, and helping the average citizen understand the site evaluation process.

- *Guide to Community Involvement for Site Assessment Managers (9345.4-02FS), September 1993*: This fact sheet, directed to EPA staff and site assessment contractors, suggests ways to communicate information about Superfund activities to the public throughout the site evaluation process. The document discusses the most effective ways to address citizens' concerns and provides answers to the most commonly asked questions.
- *Site Assessment: Evaluating Risks at Superfund Sites (9345.4-03FS), September 1993*: This fact sheet, written for the general public, explains the site evaluation process in nontechnical language and suggests ways that concerned citizens can participate.